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ADAPTATION OF THE CALL SEQUENCE BY ANALYSIS OF THE HISTORY OF THE PRECEDING COMMUNICATION SEQUENCES

RELATED APPLICATION

This is a continuation of International Application No. PCT/FR00/01810, with an international filing date of June 28, 2000, which is based on French Patent Application No. 99/08331, filed June 29, 1999.

TECHNICAL FIELD

My disclosure pertains to computer-based telecommunications centers.

BACKGROUND

Telecommunications and digital data transfer converge with the use of X.25-type digital telecommunications standards and the TCP/IP data-transfer protocol. It is already possible to transfer telephone calls in an open network using the TCP/IP protocol.

In closed networks, use is made of Computer and Telecommunications Centers (CTC) in which the telecommunications equipment (PABX or terminal) is linked with the organization's computer system. The objective is to exchange information between the two environments so as to create new common applications. Thus, with the subscriber identification service present on digital communication systems and the switched telecommunication network (STN), a file pertaining to the caller can be imported from a database and displayed on the screen of the destination station computer even before the destination station responds to the call.

A simple microcomputer equipped with a modem and provided with telecommunications and answering-recording functions already represents a true CTC solution. The case of transmission of simple faxes from fax numbers recorded in a database could likewise be considered to be an elementary CTC.

Office automation CTC applications pertain to unified messaging (fax, voice, e-mail, paging), the display of client information in relation to its telephone number or personal code and the management of calls on the screen. Automatic Call Distribution (ACD), an automatic call distribution technique, enables regulation of the flows of incoming calls placed in waiting queues. At present, many companies and independent workers are equipped with separate electronic messaging, voice mail and fax systems. However, a unified messaging system that groups together all of these services is more advantageous. Such a system makes it possible to listen to, read and display the three types of messages from a single platform and to do so in the desired order. Moreover, the system can be parameterized to receive messages in a given form and transmit them in another form. Thus, by means of text conversion technology, electronic messages and faxes can be converted into voice messages accessible from a fixed or mobile telephone. The user has at his disposal a single telephone number. The computer then has to search for the party and to forward the correct message adapted to the correct terminal.

CTC increases productivity. Due to the evolution of the technologies, a CTC solution can operate, without central PABX, simply on a server equipped with voice cards. This "PCPABX" concept applies to small structures with at most 20 to 50 lines. Among its advantages, CTC promotes organization within the company. The circulation of paper is reduced in favor of electronic information transfers. Tools enable recognition and orientation of the caller in relation to predefined scripts, automatic calling up of the caller's file, personalization of waiting messages and messaging outside of working hours, and workflow management for all of the organization's services.

The various call centers using unified messaging confront a problem of optimizing the calls. The sequential search for a party through its different numbers can become quite time-consuming and tedious if this party has a large number of telephone and fax numbers, and digital addresses.

It would be advantageous to resolve this problem by providing a method enabling improvement of the connection means and optimization of the number of calls required to connect a party.

SUMMARY

I provide a process for management of data transfer to a specific destination station having at least one real address including defining a virtual address of a destination station comprising an ordered sequence of real addresses of the destination station, sequentially searching through different addresses until obtaining a positive response establishing a communications channel, and transferring data to a multiplicity of telecommunications supports.

I also provide a communication device including telephonic communications transport means and data transfer means, means for storing in a memory calls issued and/or received by a party, means for storing in the memory addresses enabling connection of the party and means for sequential calling of a destination station from a list of addresses, and means for the storage in the memory of a history of past communication sequences and means for modeling optimal sequences for a multiplicity of telecommunications supports.

DETAILED DESCRIPTION

I provide a process for the management of data transfers to a specific destination station possessing at least one real address comprising a step of definition of a virtual address of the destination station comprising the ordered sequence of the real addresses of said destination station, a step of sequential searching through the different addresses until obtaining a positive response establishing a communications channel and a data transfer step. At each failure and/or success in establishing communication, the communication parameters are stored in memory and the data stored in memory are processed so as to define the optimal communication establishment parameters.

The processing performed on the data stored in memory consists advantageously of an iterative learning process, particularly a neural network.

In one variant, the processing performed on the data stored in memory consists of a statistical processing.

I also provide a device comprising telephonic communications transport means and data transfer means, means for storing in memory the calls issued and/or received by a party, as well as means for storing in memory the addresses enabling connection of a party and means for the sequential calling of a destination station from the list of its addresses. It comprises means for the storage in memory of the history of past communication sequences and means for modeling the optimal sequences.

The disclosure applies in an integrated instruction management environment applicable to all types of telecommunications, including voice telecommunications (fixed or mobile telephone, IP voice protocol), data (fax, telephone messaging, electronic messaging, file transfer via modem) or mixtures thereof (teleconferencing).

The user's instructions (general or specific, permanent or temporary) can be specified in relation to the telecommunications supports, telephone numbers, identification numbers or the localization of the parties, the nature of the messages, and the time and place.

One application of the disclosure makes it possible for the user to be connected under all circumstances by connecting to his call partners or by the rapid and reliable transmission, by all of the available telecommunications supports, of their messages. The disclosure also allows the user to accelerate his search for his call partners (for the purpose of voice connections or message transmissions) and to optimize the associated telecommunication costs by the selective choice of the outgoing telecommunications network used ("Least Cost Routing").

The disclosure comprises automatic and semiautomatic modes. The automatic modes apply to the processing operations (generally the routing of calls or messages) which do not require intervention by an operator from the call center. The semiautomatic modes require intervention of an operator and enable the execution of higher functions (such as the interpretation of the party's requests, searching for or supplying information, scheduling appointments, interactive filtering). In the case of the semiautomatic modes, the automatic functions of the application are intended to enhance the productivity of the operators, the optimization of the telecommunications costs and the enhancement of the security of the data.

In a sequence of sequential calls of the different addresses of a party, it is possible that the party can always be reached via the same address at a given moment. A simple example consists of considering that a person will be at his workplace during the day and at home the rest of the time. A conventional sequential call will not make a distinction between these different possibilities unless an external operator had previously provided for such by specifying the call conditions. This quickly becomes tedious if one has many call partners.

In order to improve the number of successful calls, all of the parameters of a call are stored in memory. The most important parameters consist of the time and date of the call, call address, and success or failure of the call.

Based on these data, it is possible to perform a specific processing which evaluates the call partners' habits. A neural network is the most effective tool in this case. By means of iterative learning, it enables modification of the sequence of calls performed in relation to time. These modified sequences are stored in memory in a specific virtual address. In our example, it would try to reach the home of the person to be contacted before trying the workplace if it is midnight. In a

variant, it could inform the caller that the party has never responded to a call after midnight and propose leaving a message for the next day.

Classic statistical methods such as principal component analysis can also be employed to reach these conclusions.

Since the call log is accessible at all times, it is very advantageous to update the information regarding the virtual addresses with each call, performing the processing of the information when the system activity is lower.

The disclosure is not limited to call centers or to unified messages; it applies to all fields in which the sequences of actions are predefined independently of the result of these actions.